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ABSTRACT

Increased concern with the environment has increased opportunities for employment in the environmental job market. This digest helps clarify the meaning of environmental employment and discusses aspects of its present state. An examination of trends in environmental employment indicates a growing demand for new jobs in environmental fields created from either remedial actions, such as clean-ups and regulatory actions, or from prevention activities. Growth in other careers such as foresters and conservation scientists is expected to be slow. A classification of jobs in environmental fields is done according to content-focus and position-focus. Content-focus careers include careers in pollution prevention and control, disease prevention, and environmental planning. Position-focus careers include careers in environmental science, environmental policy, environmental information, and related professions. Since environmental science is an interdisciplinary arena, preparation for environmental occupations requires an understanding of biology, chemistry, and the physics of the environment; problem solving and mathematics skills; and preparation in a specific area of interest. Contains 13 references. (MDH)

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Environmental Studies and Environmental Careers

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U.S. DEPARTMENT OF EDUCATION
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Environmental careers could be defined as those jobs "involved with the protection and conservation of nature, natural resources and inhabitants of our land" (Hendrix & Cegiel, 1990). Over the past few decades, there has been increasing concern with the environment, reflected in the increasing general awareness of environmental concerns. As concern has increased, opportunities in the environmental job market have also increased (Dalaney & Gaylord, 1991). These positions have been given labels ranging from "tree hugger" and "environmental expert" to "environmentalist." What are these careers and how do students prepare for them?

Harper and Stein (1983) distinguish between *environmental experts* such as biologists, ecologists, chemists, and engineers, versus *environmentalists* who work in professions that include a moral position "to protect the rights of persons to an environment that allows them to pursue their goals" (p. 31). Professionals in the environment are those whose work focuses on the human or natural environment. They have mastered a particular body of knowledge and are dedicated to the ethical application of that knowledge in all their work (Ehrhardt, 1990).

This digest will briefly examine trends in environmental employment, present ways in which careers can be identified within the environmental arena, and then discuss the preparation needed for a successful career in the environmental field.

Trends in Environmental Employment

Wobbe (1992) suggests that the future "will be marked by a growing demand for processes which involve the lowest possible release of eco-impacting materials to the environment" (p.75). He continues to identify the movement as production that is oriented toward new forms of materials, new forms of production, and new products to facilitate repair, recycling, and refurbishment of products. The development of these technologies will require a wide array of professionals in many fields, all of whom are trained in environmental issues and management. In a listing of "hot tracks" for future employment, five of the 20 hot track professions were environmental positions (*U.S. News*, 1991).

Not all careers in the environment are growing fields. Positions as foresters and conservation scientists, for example, are expected to increase at a lower than average rate, with most of the jobs coming through retirements and vacancies, not new positions (Occupational Outlook Handbook, 1992). Many of the new jobs in the environmental field are the highly specialized professions, such as specialties within biology, geology, civil engineering, and chemistry (Branch & Luciano, 1992). New jobs in the environmental fields are being created primarily from either remedial actions (Superfund clean ups, regulatory action) or from minimization and prevention activities (rethinking manufacturing, pollution prevention), both of which require a strong science focus. Whether it is the basic science, or the technology to apply the science, part of the movement toward environmental occupations is seeking the "solution of common problems of people, such as global environmental disruption...exhaustion of non-renewable energy and other resources" (Zaitsev, 1992, p.86).

What are these jobs?

In examining environment-related employment opportunities, it is possible to explore career options either by "content" or by "position." Content refers to employment opportunities that directly relate to certain areas of study, focus, or preparatio.., such as water, air, or solid waste. Position relates more specifically to the type of position, such as educator, toxicologist, or geophysicist, and the setting in which the work occurs including public, private, not for profit organization, or regulatory agency.

Content-focus

Careers, and the formal preparation for those careers, can be identified by the subject matter focus of the work. One listing of content organized employment opportunities (Environmental Communications, 1990) includes:

- Hazardous Waste Management and Reduction.
- Solid Waste Management and Recycling.
- Land Use and Preservation.
- Housing and Community Development.
- Water-related Issues.
- Air-related Issues.
- Fish and Wildlife Management.
- Fund Raising and Foundation Work.
- Environmental Education.

Another classification [Resource Control (Hendrix & Cegiel, 1990)] separates careers into:

- Pollution Prevention and Control.
- Disease Prevention.
- Environmental Planning.

These approaches suggest that to identify a career interest, one identifies first the particular subject or content which appeals and explore the content. From exploring the content, opportunities for using the content will emerge. Erhardt (1990) recommends that an individual choose a favorite aspect of the natural or human environment, and it will likely have a career aspect related to it.

Position-focus

The more traditional approach to career identification is through a position approach. In this approach, types of positions that relate to the subject are identified. We can identify positions for working in the environmental arena as:

Environmental Science

- Research & Development (laboratory technicians: packaging scientists; chemists; biologists; toxicologists)

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- Technical (civil engineering; transportation engineers; environmental health)

Environmental Policy

- Regulator (health regulation; environmental regulation; natural resource management regulators)
- Regulated Industry (Risk assessment; environmental compliance officers; environmental health officers OSHA compliance, Environmental Impact Assessor)
- Policy Analysis (environmental economists; consulting firms; lobbyists; environmental groups)

Environmental Information

- Education (elementary, secondary, post-secondary teachers; parks; nature centers; hands-on science museums or centers; outdoor education)
- Communications (newspapers; mass media; communications for environmental concerns for private industry; information officers for public agencies)
- Interpretation (parks; nature centers; hands-on centers; exhibition halls; zoological gardens; tourist centers)

Related Professions

- Environmental Law
- Biomedical Engineering
- Environmental Health

Of course, many careers can fit within many different areas. A marine biologist, for example, can be in research, or in the technical application of the science, or be working for the government in a regulatory capacity, or be teaching within a formal or non-formal setting.

Preparation

Delaney and Gaylord (1991) observed that "Environmental careers are diverse and dynamic...opportunities range from media driven research work...to site specific challenges. One site project may require the professional services of a cadre of professionals such as engineers, hydrologists, toxicologists, heavy equipment operators and administrative support. Moreover, these opportunities will exist in all employment sectors—corporate, consultant, government and nonprofit" (p.87).

What does it take to have a career in these fields? Whether it is a position as an environmental lawyer, a park ranger, or a marine scientist, "saving the environment most likely requires a degree in chemistry...or engineering...or communications. Anyway you go about it, science—and math—are eventually required" (Martin, 1992, p.26). Environmental science is an interdisciplinary arena, and working toward an environmental career requires an understanding of biology, chemistry, and the physics of the environment (Posnick, 1989).

A career in the environment also calls for reasoning and problem-solving, involving math, geometry, and simple algebra skills. Yet, less than half of twelfth graders currently have these skills. Furthermore, only 5% of high schools seniors operate with knowledge of beginning statistics and probability (Kutscher, 1992). Day, Astin and Korn (1991) note that less than 35 percent of high school students are meeting the recommended two years of biological sciences and less than 50% are receiving the recommended two years of physical sciences. A well-grounded preparation in mathematics as well as science is needed for many if not most careers in the environment. Whatever the career choice, basic mathematics and science preparation along with skills for applying these concepts is important for success.

Preparation for a career in an environmental field includes focusing on a specific area of interest, while developing highly transferrable skills. Martin (1992) called this a balance between well-rounded generalism and marketable specialization. The person who achieves this will have a successful and highly rewarding career in the growing environmental field.

As we continue to discover the relationship of the environment in all aspects of our society, the need for well-prepared professionals and technicians in the many environmental science, education, and policy careers also grows. Whether public or private, regulator or regulated, policy maker or policy analyst, the expanding opportunities in environmentally related occupations are ever changing, ever challenging, and ever increasing.

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